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Andreas Herkersdorf

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SCULLY, SCOTT, MURPHY & PRESSER, P.C.

400 GARDEN CITY PLAZA

SUITE 300

GARDEN CITY, NY 11530

EXAMINER

CHEA, PHILIP J

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/658,311	<b>Applicant(s)</b> HERKERSDORF ET AL.	
	<b>Examiner</b> PHILIP J. CHEA	<b>Art Unit</b> 2153	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12, 15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 15 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

This Office Action is in response to an Amendment filed January 31, 2008. Claims 1-12,15-16 are currently pending. Any rejection not set forth below has been overcome by the current Amendment.

#### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12,15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 12 and 15 recites the broad recitation "storage device", and the claim also recites "tangibly embodying a program" which is the narrower statement of the range/limitation. The term "tangibly" is rejected because the definition today may not necessarily mean the same thing in the future.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1,2,6,11-12,15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uga et al. ("A fast and compact longest match prefix look-up method using pointer cache for very long network address"), herein referred to as Uga, and further in view of Kadambi et al. (US 6,795,447), herein referred to as Kadambi.

As per claims 1,12,16, Uga discloses processing a data packet, having a destination IP address, towards a routing destination (see page 595, left-hand column second paragraph below

INTRODUCTION, describing a router processing an IP packet with a network address for a destination implying that the network address is an IP network address because it is using the IP protocol); and

determining a default-route-prefix that is a part of the destination IP address during a default-route determination step (see page 597, right-hand column second paragraph, describing a determination step to determine a default-route prefix that is part of the destination IP address (i.e. prefix that match the network address) and page 595, paragraph below Fig. 1, showing that the table contains network addresses that are part of the destination IP address ), when in a routing table cache and in a routing table, there is no entry with a destination address prefix that is a prefix of the destination IP address (see page 597, right-hand column second paragraph, further showing a lookup in the routing table cache for a matching prefix and a situation when a prefix cannot be found in the routing cache or the routing table);

wherein the routing table cache comprises a prefix that is a part of a destination IP address and the destination IP address (see page 597, third paragraph, showing that the prefix is part of a destination IP address and the destination IP address, in the example the prefix is 10.8 which is part of a destination 10.8.0.5 and part of the destination 10.8.128.3).

Although the system disclosed by Uga shows substantial features of the claimed invention (discussed above), it fails to disclose that the default-route-prefix is provided only in a routing table cache.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Uga, as evidenced by Kadambi.

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In an analogous art, Kadambi discloses a communications component comprising a first data port interface supporting a plurality of data ports transmitting and receiving data (see Abstract), relating to high performance switching in local area communication networks (see column 1, lines 22-23). Kadambi further discloses that a prefix is provided only in a routing table cache (see column 26, lines 10-22). Although Kadambi shows a prefix and not a default-route-prefix, it is obvious that any type of prefix such as a default-route-prefix could be stored in the cache.

Given the teaching of Kadambi, a person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Uga by providing a prefix only in a routing table cache, such as disclosed by Kadambi, in order to provide flexibility of providing support for different protocols without having any negative effect on system performance (see Kadambi column 26, lines 10-16).

As per claim 2, Uga further discloses that the default-route-prefix is determined to be said prefix of at least the destination IP address (see page 597, right-hand column, second paragraph describing an outgoing route (i.e. a destination)).

As per claim 6, Uga further discloses that the default-route-prefix is entered together with a default routing destination as an entry into the routing table cache (see page 597, left-hand column, first paragraph, describing how each entry in the cache table has a pointer to an intermediate node in the tree).

As per claims 11,15, Uga discloses processing a data packet, having a destination address, towards a routing destination (see page 595, left-hand column second paragraph below INTRODUCTION, describing a router processing a packet with a network address for a destination), wherein a default-route-prefix that is part of an IP address resides together with a default routing destination as an entry in a routing table cache (see page 597, right-hand column, second paragraph, describing how a default-route-prefix resides with a default outgoing (i.e. destination) route); and

forwarding the data packet to said default routing destination, when the default-route-prefix matches at least part of said destination IP address (see page 597, right-hand column, bottom of second paragraph, describing that the default outgoing route is the outgoing route of the longest match prefix).

6. Claims 3-5,7-10 rejected under 35 U.S.C. 103(a) as being unpatentable over Uga in view of Kadambi as applied to claim 1 above, and further in view of Kobayashi et al. (US 6,768,739), herein referred to as Kobayashi.

As per claim 3, Uga discloses that the first lookup step for the destination IP address the destination address prefix being said prefix thereof is searched in the routing table cache (see page 597, right-hand column, second paragraph describing a first lookup in the routing table cache for a matching prefix).

Although the system disclosed by Uga in view of Kadambi shows substantial features of the claimed invention (discussed above), it fails to disclose wherein if the said first lookup step results in not finding such destination address prefix, in a second lookup step for said destination IP address the destination address prefix being a prefix thereof is searched in the routing table.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Uga in view of Kadambi, as evidenced by Kobayashi.

In an analogous art, Kobayashi discloses a router allowing the entry hit probability of the cache to be increased where a cache is search issuing a different mask for each cache entry and a cache entry allowing a plurality of destination addresses to be hit can be registered in the cache, resulting in increased cache hit probability (see Abstract). Kobayashi further discloses when a destination address in a cache is not hit, a second lookup step is preformed for the destination address in a routing table (see column 13, line 56 – column 14, line 3).

Given the teaching of Kobayashi, a person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Uga in view of Kadambi by employing a second lookup in the router table when the first lookup does not return a value, such as disclosed by Kadambi, in order to determine the path the packet must go when the cache does not contain the destination address.

As per claim 4, Kobayashi further discloses that if the second look step on the routing table results in finding the destination address prefix being said prefix of the destination IP address a matching destination address prefix, the found destination address prefix entry is entered into the routing table

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cache in a cache update step, and the data packet is forwarded in a destination forwarding step to a corresponding routing destination (see column 13, line 65 - column 14, line 3, describing the data packet being forwarded to a corresponding destination and column 14, lines 20-28, describing how the cache is updated with the destination output lines and the destination address).

As per claim 5, Uga further discloses if the second lookup step results in not finding the destination address prefix being said prefix of the destination IP address, in a default forwarding step the data packet is forwarded to a default routing destination (see page 597, right-hand column, second paragraph).

As per claim 7, Uga further discloses that in the first lookup step the routing table cache is searched for covering path entries that reside in the routing table cache, the cover path entries in their totality being a prefix for at least all destination address prefixes existing in the routing table (see page 597, right-hand column, second paragraph, describing how an address can be aggregated (i.e. covering path) into an aggregation node).

As per claim 8, Uga further discloses that in an event that the first lookup step results in finding no covering path entry for the destination IP address, the data packet is forwarded to a default routing destination in a default forwarding step (see page 597, right-hand column, second paragraph, describing how if an aggregated prefix (i.e. covering path) is not found, forwarding the packet to a default address).

As per claim 9, Uga further discloses that in an event that the first lookup step results in finding one of said covering path entry for the destination IP address, in the second lookup step for said destination address the destination address prefix being said prefix of the destination address is searched in the routing table (see page 597, right-hand column, second paragraph, describing how the aggregation node (i.e. covering path entry) might be valid).

As per claim 10, Uga, further discloses that in an event that the first lookup step results in finding the destination address prefix being said prefix of the destination IP address, the data packet is forwarded in a destination forwarding step to a corresponding routing destination (see page 597, right-hand column, third paragraph).

***Response to Arguments***

7. Applicant's arguments filed January 31, 2008 have been fully considered but they are not persuasive.

A) Applicant contends that Uga does not disclose that the default-route-prefix is a part of the destination IP address.

In considering A), the Examiner respectfully disagrees. Uga shows that IP addresses are stored in a routing table that is configured as a tree (see page 596, left hand column paragraph 3, *showing a longest matching prefix table look-up method for long network address the network address are IP addresses because the IP protocol is used* (see page 595, left-hand column second paragraph below INTRODUCTION, *describing a router processing an IP packet with a network address for a destination implying that the network address is an IP network address because it is using the IP protocol*)). The CAMs are merely used as storage locations for the prefixes. The Examiner believes that the prefixes are still part of the network addresses. For instance in page 595, paragraph below Fig. 1, Uga discloses that destination addresses 129.60.83.128 and 129.60.83.1 have a common prefix of 129.60.83 which is part of the network destination address. The Examiner believes that tree holds the prefix addresses AND a pointer to the next tree. For example on page 597, Fig. 5, the prefixes are stored as well as the next hop pointer. Therefore, the Examiner believes the CAM still stores the prefix addresses which are part of the destination address, along WITH a separate pointer to the next node.

B) Applicant contends that Uga does not disclose that the default-route-prefix is provided only in a routing table cache.

In considering B), the Examiner has provided a secondary reference Kadambi to teach the deficiency of Uga. Please see rejection above.

C) Applicant contends that Uga does not disclose the features of claims 3 and 4.



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In considering C), the Examiner has introduced a supporting reference for the missing features of Uga and Kadambi.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHILIP J. CHEA whose telephone number is (571)272-3951. The examiner can normally be reached on M-F 6:30-4:00 (1st Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Burgess can be reached on 571-272-3949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Glenton B. Burgess/  
Supervisory Patent Examiner, Art Unit 2153

Philip J Chea  
Examiner  
Art Unit 2153

PJC 4/1/08